Highway Safety Improvement Program

Data Driven Decisions

California
Highway Safety Improvement Program
2016 Annual Report

Prepared by: CA

Disclaimer

Protection of Data from Discovery & Admission into Evidence

23 U.S.C. 148(h)(4) states "Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose relating to this section [HSIP], shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location identified or addressed in the reports, surveys, schedules, lists, or other data."

23 U.S.C. 409 states "Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data."

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Executive Summary

Executive Summary

The Moving Ahead for Progress in the 21st Century Act or "MAP–21" (Pub. L. 112–141, 126 Stat. 405), was signed into law July 6, 2012, and continued the Highway Safety Improvement Program (HSIP) as a core program under title 23 United States Code section 148 to reduce fatalities and injuries on all public roadways. Title 23 United States Code section 148(h) requires each state to submit an annual report to the Federal Highway Administration (FHWA) regarding its HSIP implementation and effectiveness and title 23 Code of Federal Regulations sections 924.15(a)(1) and 924.15(a)(2) specify that the report be submitted no later than August 31 of each year.

This annual report describes the progress being made to implement projects and the status of program evaluations for the HSIP as described in Title 23 United States Code section 148, and for High-Risk Rural Roads (HR3) (23 U.S.C. § 148(g)). The Railway-Highway Crossings (23 U.S.C. § 130(g)) report is submitted to FHWA directly by the California Public Utility Commission as a separate report.

Under the "MAP–21" (Pub. L. 112–141, July 6, 2012; 126 Stat. 405), the High-Risk Rural Roads program was merged into the HSIP for safety improvements on public rural roadways that meet the functional classification requirements of title 23 United States Code section 148(a)(1). In addition to the above, in accordance with title 23 United States Code section 164 repeat intoxicated transfer funds, approximately $60.79 million was obligated for alcohol impaired driving countermeasures. These funds will be used to support the California Strategic Highway Safety Plan activities.

Caltrans' Division of Traffic Operations provided information on the State Highway System (SHS) for this report, and Caltrans' Division of Local Assistance for local roads and the HR3 Program. Caltrans implements the HSIP for State highways by programming and funding projects in the Collision Reduction Category, one of eight categories that make up the State Highway Operation and Protection Program (SHOPP). The Collision Reduction Category is further divided into two programs: Safety Improvement, and Collision Severity Reduction. The Safety Improvement Program is among Caltrans' top priorities in the SHOPP. The projects evaluated in this report are funded by the Collision Reduction Category, which includes both federal HSIP and State highway funds.

Caltrans uses the Transportation System Network (TSN) database to identify locations with significantly high collision concentrations. The identified locations are systematically

investigated to determine probable causes of the collisions in order to implement effective countermeasures to improve safety. Other locations identified for investigation and possible implementation of countermeasures are generated from three Monitoring Programs: Cross Median Collisions, Two and Three Lane Cross Centerline Collisions, and Wrong Way Collisions. Nearly 2,972 traffic safety investigations were completed between 01-01-2015 and 12-31-2015. In addition, 509 "Other Safety" investigations were completed. These other safety related investigations were not generated by TSN but by calls, letters, and e-mails from public. Finally, as of February, 2012, Caltrans has developed and in the process of implementing a 5-year "California Roadway Departure Safety Implementation Plan" which identified over 7,000 locations for potential low cost countermeasures to systematically implement on many state highways in an effort to reduce roadway departure crashes.

For this year's reporting period, the most recent ten-year data available in TSN database was for 2004 to 2013. During the 2013 calendar year, 1,076 fatal collisions, 41,791 injury collisions, and 69,777 property-damage-only (PDO) collisions were reported on the SHS. Caltrans estimates that these collisions resulted in societal economic losses of approximately $19.6 billion assuming collision costs for various injury severities derived by the National Safety Council.

The HSIP and other State programs have contributed to making highways safer through the implementation of highway safety projects. This fact is evident from the fatality rate trends. Between 2004 and 2013, the fatality rate on all State highways has decreased 34 percent. For the same period, the fatality rate on freeways decreased 34 percent, and on non-freeways it decreased 25 percent. During the same period, the annual travel decreased by 2.2 percent on all highways. The annual travel on freeways decreased 0.3 percent, and on non-freeways it decreased by 10.2 percent. Freeway travel in 2013 accounts for 83 percent of travel on the SHS even though freeway road miles account for only 29 percent of the SHS.

The effectiveness of the State HSIP was measured by comparing collision data before and after safety improvements were implemented at project sites. These projects have been completed between 7/1/2011 and 6/30/2012. Three years of collision data before project implementation was compared with three years of collision data after project implementation. A total of 81 projects were considered in the evaluation. Analysis of collision data was based on 140 highway locations as some of the projects contained more than one highway location. The cost of implementing these projects was $144.9 million. The annual savings, in terms of reductions in collision frequency and severity, was estimated at $86.2 million. This translates to a savings of $1725 million or a benefit-cost ratio of 11.9 to1, assuming a project life of 20 years.

A set of 4 performance measures were calculated for California highways including state and local roads. The performance measures were defined as five year rolling average of collision frequencies and collision rates for each of the five years, 2009 thru 2013. These performance measures are: 1) the number of fatalities, 2) the number of fatalities per 100 Million Vehicle

Miles of Travel (MVMT), 3) the number of persons severely injured, and, 4) the number of persons severely injured per 100 MVMT. The data used to derive the rolling averages is from 2004 to 2013. The rolling averages show a decreasing trend, indicating improvement in road safety on California state and local roads.

MAP-21 put focus on certain areas such as older driver and pedestrian fatalities and severe injury rates per capita. Comparison of the 5 year rolling averages for older driver and pedestrian fatal + injury are done for two time periods, 2008-2010 and 2012-2014. The most recent data available was for 2014. Using these two time periods, the moving averages for number of persons killed + the number persons severely injured show a downward trend and therefore the implementation of the special rule as set by MAP 21 does not apply. The data is for all public roadways in the state.

Introduction

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. As per 23 U.S.C. 148(h) and 23 CFR 924.15, States are required to report annually on the progress being made to advance HSIP implementation and evaluation efforts. The format of this report is consistent with the HSIP MAP-21 Reporting Guidance dated February 13, 2013 and consists of four sections: program structure, progress in implementing HSIP projects, progress in achieving safety performance targets, and assessment of the effectiveness of the improvements.

Program Structure

Program Administration

How are Highway Safety Improvement Program funds allocated in a State?

Central

Describe how local roads are addressed as part of Highway Safety Improvement Program.

Caltrans Division of Local Assistance (DLA) uses an HSIP application benefit-cost tool to provide a consistent, data-driven methodology for ranking local roadway (non-State owned and operated) project applications on a statewide basis. This tool was developed by the DLA in conjunction with the University of California, Berkeley, Safe Transportation Research and Education Center. The DLA HSIP also provides the Local Roadway Safety Manual for California local road owners and directly incorporates UC Berkeley's Transportation Injury Mapping System website to assist applicants applying for local HSIP funds. These tools and resources encourage local agencies to proactively analyze their roadway networks for the highest crash locations and develop and submit applications with the greatest chance of reducing fatalities and serious injuries using low cost proven systemic countermeasures.

Identify which internal partners are involved with Highway Safety Improvement Program planning.

Planning
Other-Research Innovation and System Information
Other-HQs' Traffic Safety and Mobility Program and 12 district offices within Traffic Operations, plan safety projects on the state highway system. Caltrans Division of Local Assistance in conjunction with local agencies, plans projects on local roads.

Briefly describe coordination with internal partners.

On the State Highway System, the Traffic Safety and Mobility Program in Headquarters within the Division of Traffic Operations works with the Planning Division, Division of Programming, Division of Research Innovation and System Information, and 12 Caltrans district offices to develop Project Initiation Documents to program projects. For local roads, Caltrans Division of Local Assistance (DLA) staff manage the local agency share of HSIP funds in conjunction with its local agency partners. The DLA prepares the HSIP guidelines and solicits project applications from local agencies.

Identify which external partners are involved with Highway Safety Improvement Program planning.

Metropolitan Planning Organizations
Local Government Association
Other-California Office of Traffic Safety (OTS)
Other-Caltrans has been working with 400 stakeholders from 170 public & private agencies to develop CA-SHSP. Projects developed are consistent with SHSP strategies. Caltrans' DLA with local agencies are involved in planning projects on local roads.
Other-Federal Highway Administration

Identify any program administration practices used to implement the HSIP that have changed since the last reporting period.

Other-The California Local HSIP Advisory Committee was established by Division of Local Assistance. This is a committee of transportation safety stakeholders that supports the goal of reducing fatalities and serious injuries on local roads in California.

Describe any other aspects of Highway Safety Improvement Program Administration on which you would like to elaborate.

The California Strategic Highway Safety Plan (SHSP) was updated in September 2015. Caltrans is currently evaluating traffic safety monitoring programs to align with the SHSP priorities, and rewriting HSIP Guideline to be in compliance with rules adopted in April 2016.

Program Methodology

Select the programs that are administered under the HSIP.

Median Barrier	Roadway Departure	Other-2 & 3 Ln Cross Centerline Collision Monitoring Pro
Other-Wrong-Way Monitoring Report	Other-Local Roads Program	

Program: **Median Barrier**
Date of Program Methodology: **11/15/1977**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Volume	Median width
Fatal crashes only		Functional classification

What project identification methodology was used for this program?

Crash frequency
Crash rate

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-Any project that meets the established Median Barrier criteria for project selection can be programmed

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).
Rank of Priority Consideration

Collision and volume warrants	100

Program: **Roadway Departure**
Date of Program Methodology: **11/15/2004**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
	Volume	Functional classification
	Lane miles	Roadside features
	Other-Fatal and injury crashes on Wet Pavement	
Other-see the optional description		Other-Fatal & injury crashes resulting in Overturned Vehicle

What project identification methodology was used for this program?
Crash frequency
Crash rate
Other-see the optional description for this question

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-see the optional description for this question

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

100%	top 25% of run-off-road concentration locations with higher scores +100% of identified long segments selected based on collision frequency, roadway type, geometric characteristics and traffic volume.	100

Program: **Other-2 & 3 Ln Cross Centerline Collision Monitoring Pro**
Date of Program Methodology: **1/15/1985**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
Fatal crashes only	Volume	Functional classification
Other-See optional description pertaining to this subprogram	Lane miles	

What project identification methodology was used for this program?
Crash frequency
Crash rate

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-All projects meeting established criteria can be programmed

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).
Relative Weight in Scoring

Crash frequency and rate	100

Program: **Other-Wrong-Way Monitoring Report**
Date of Program Methodology: **1/15/1985**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes	Lane miles	Functional classification
Fatal crashes only		

What project identification methodology was used for this program?
Crash frequency
Crash rate

Are local roads (non-state owned and operated) included or addressed in this program?
No

How are highway safety improvement projects advanced for implementation?
Other-Any project that meets the criteria for wrong way collisions can be programmed

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).
Relative Weight in Scoring

Crash Frequency and crash rate	100

Program: **Other-Local Roads Program**
Date of Program Methodology: **9/3/2010**

What data types were used in the program methodology?

Crashes	*Exposure*	*Roadway*
All crashes		

What project identification methodology was used for this program?
Crash frequency
Other-Collision History (5 years minimum), Collision Reduction Factors, Life of Improvement, Project Costs

Are local roads (non-state owned and operated) included or addressed in this program?
Yes
If yes, are local road projects identified using the same methodology as state roads?
No

If no, describe the methodology used to identify local road projects as part of this program.
HSIP application benefit-cost tool started with Cycle 4 “call for projects” in Fall 2010

How are highway safety improvement projects advanced for implementation?
Competitive application process
Other-HSIP Application Benefit-Cost Tool

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Ranking based on B/C	1
Competitive application process	

What proportion of highway safety improvement program funds address systemic improvements?

35%

Highway safety improvement program funds are used to address which of the following systemic improvements?

Other-Median Barrier (see optional description)

What process is used to identify potential countermeasures?

Engineering Study
Other-Moving toward HSM methodology

Identify any program methodology practices used to implement the HSIP that have changed since the last reporting period.

Other-Rolling out pedestrian safety monitoring program

Describe any other aspects of the Highway Safety Improvement Program methodology on which you would like to elaborate.

1) Preliminary progress in HSM implementation is made to integrate Highway Safety Manual Roadway Safety Management Process that includes network screening, diagnosis, countermeasure selection, economic appraisal, project prioritization, and effectiveness evaluation as a framework for highway safety improvement decision by incorporating HSM methodologies and tools.

2) Caltrans is currently undertaking a research project to develop safety performance functions for highways, intersections and ramps to be used in the Safety Analyst system which is consistent with the methodology in Highway Safety Manual (Type-I & Type-II performance functions). The goal is to replace the existing Traffic Accident Surveillance and Analysis System (TASAS) with Safety Analyst. Excel spreadsheets that incorporate the new SPFs are being developed as an interim tool.

3) A comprehensive set of Performance Functions for various road types, intersections and ramps are being developed that will impact our identification of locations with high collision concentrations.

Progress in Implementing Projects

Funds Programmed

Reporting period for Highway Safety Improvement Program funding.

State Fiscal Year

Enter the programmed and obligated funding for each applicable funding category.

Funding Category	Programmed*		Obligated	
HSIP (Section 148)	$502,312,000.00	77 %	$321,031,344.00	68 %
HRRRP (SAFETEA-LU)	$9,633,734.40	1 %	$9,633,734.40	2 %
Penalty Transfer – Section 164	$60,797,613.00	9 %	$60,797,613.00	13 %
Other Federal-aid Funds	$83,060,431.00	13 %	$83,060,431.00	18 %

(i.e. STP, NHPP)				
Totals	$655,803,778.40	100%	$474,523,122.40	100%

Funding summary provided by Caltrans Division of Local Assistance are:

HSIP Dollars Programmed in FFY 15/16 under 2016 FTIP as of 6/30/16	$108,187,682
HSIP Dollars Obligated (Construction Authorization Date: 7/1/15 to 6/30/16)	$69,607,920
Percent HSIP Dollars Obligated	64%

How much funding is programmed to local (non-state owned and operated) safety projects?
$108,187,682.00
How much funding is obligated to local safety projects?
$69,607,920.00

How much funding is programmed to non-infrastructure safety projects?
$60,797,612.00
How much funding is obligated to non-infrastructure safety projects?
$60,797,612.00

How much funding was transferred in to the HSIP from other core program areas during the reporting period?
$225,000,000.00
How much funding was transferred out of the HSIP to other core program areas during the reporting period?

$0.00

Discuss impediments to obligating Highway Safety Improvement Program funds and plans to overcome this in the future.

Getting some Local HSIP projects delivered has been a challenge for the Local HSIP program, so in March 2015, Division of Local Assistance sent a memo to all local agencies that gave delivery deadlines for their project depending on which cycle it was programmed. If no intervention was done by the agency, their project would be removed from the program. This proved to be very successful and is now a Local HSIP policy that all current projects programmed need to have construction authorization within five years of being programmed or will be removed from the program if no justification is provided by the local agency. Project delivery delay flags are still in place for PE Authorization and Construction Authorization to let agencies know that their project is delayed after set deadlines and they will not be able to submit any future HSIP project applications until the flag(s) are cleared.

Describe any other aspects of the general Highway Safety Improvement Program implementation progress on which you would like to elaborate.

Working on incorporating the march 2016 rule into our process.

General Listing of Projects

List each highway safety improvement project obligated during the reporting period.

Project	Improvement Category	Output	HSIP Cost	Total Cost	Funding Category	Functional Classification	AADT	Speed	Roadway Ownership	Relationship to SHSP	
										Emphasis Area	Strategy
Please see "optional description"	Access management Change in access - close or restrict existing access	5 Miles	1	1	HSIP (Section 148)	Rural Minor Arterial	5000	55	State Highway Agency	Roadway Departure	reduce collision severity

The project listed in the template table for this question is a fictitious project. We had to include at least one project in the standard template so we can mark the question as complete. The list of projects both for the state highways and for the local roads are provided in two separate excel files attached to this question. One file provides the list of projects on the state highways that are awarded in State Fiscal Year 2015-16. The second file provided by the Division of Local Assistance lists projects on California local roads in State Fiscal Year 2015-16.

Progress in Achieving Safety Performance Targets

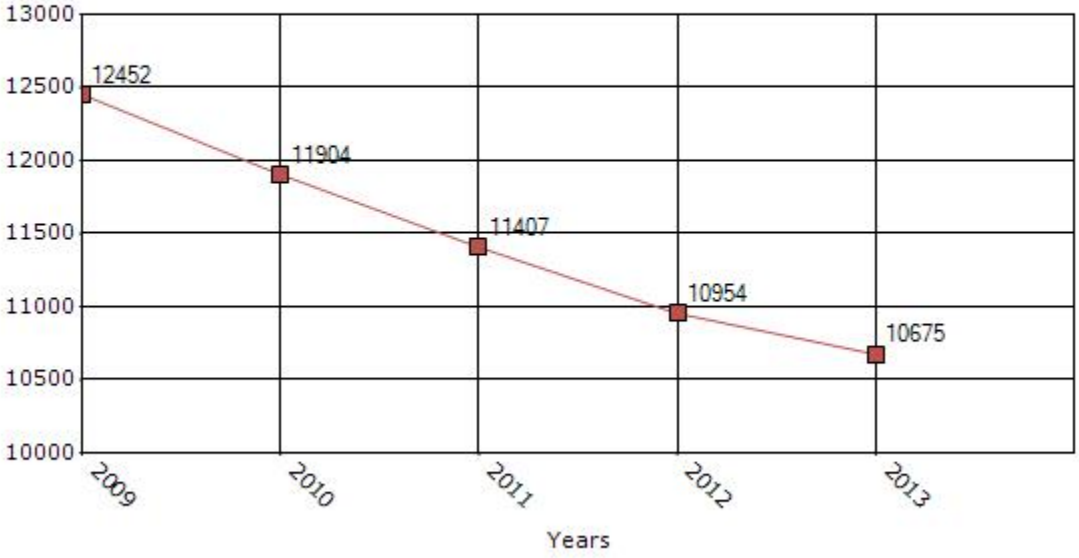
Overview of General Safety Trends

Present data showing the general highway safety trends in the state for the past five years.

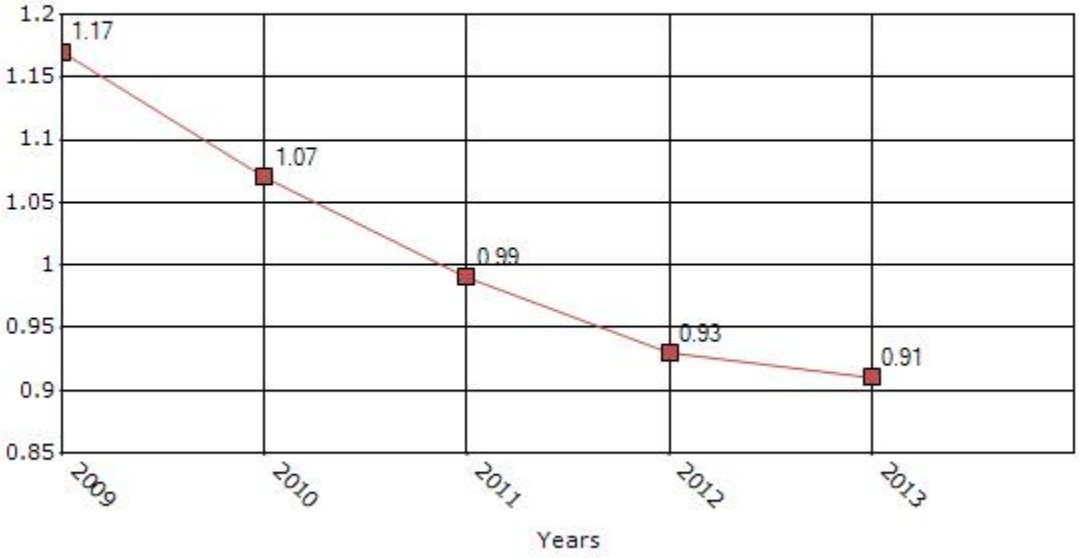
Performance Measures*	2009	2010	2011	2012	2013
Number of fatalities	3818	3496	3211	3005	2940
Number of serious injuries	12452	11904	11407	10954	10675
Fatality rate (per HMVMT)	1.17	1.07	0.99	0.93	0.91
Serious injury rate (per HMVMT)	3.8	3.63	3.49	3.36	3.29

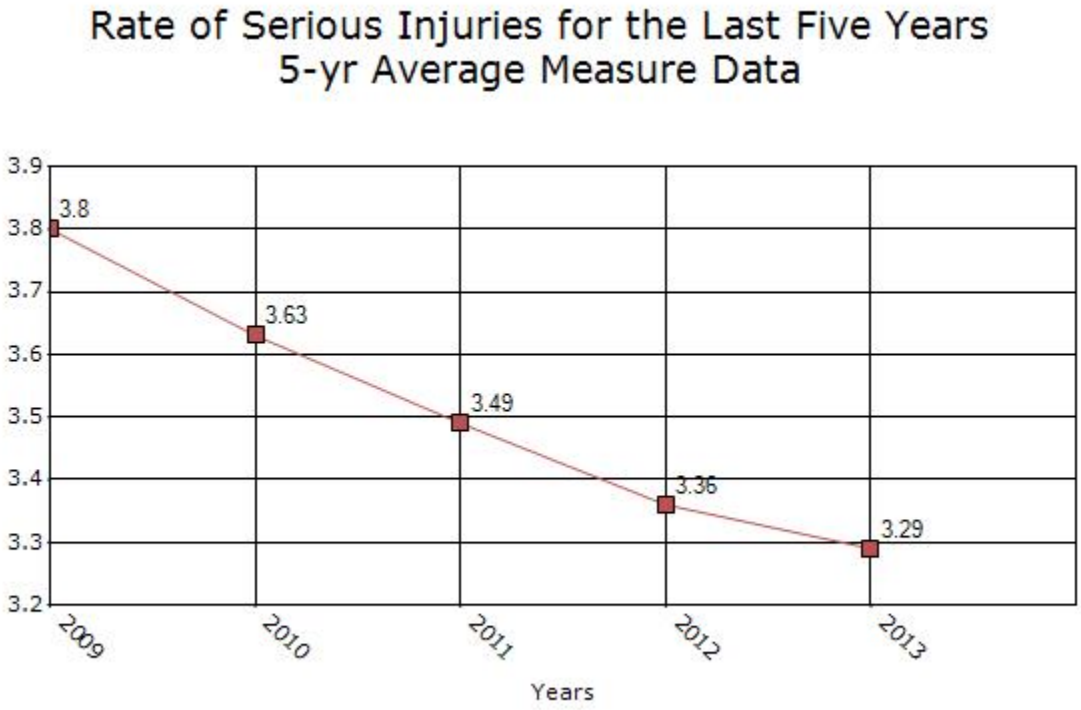
*Performance measure data is presented using a five-year rolling average.

Number of Serious Injuries for the Last Five Years
5-yr Average Measure Data



Rate of Fatalities for the Last Five Years
5-yr Average Measure Data





For this year reporting period, the performance measures are based on the number of victims killed and severely injured. Last year, the performance measures were based on counts of collisions (i.e., number of fatal collisions and number of severe injury collisions).

The data used for this question is retrieved from the California Highway Patrol's (CHP) database,(SWITRS). the definition of Severe Injury in SWITRS is;

Severe Injury. An injury, other than a fatal injury, that includes the following:

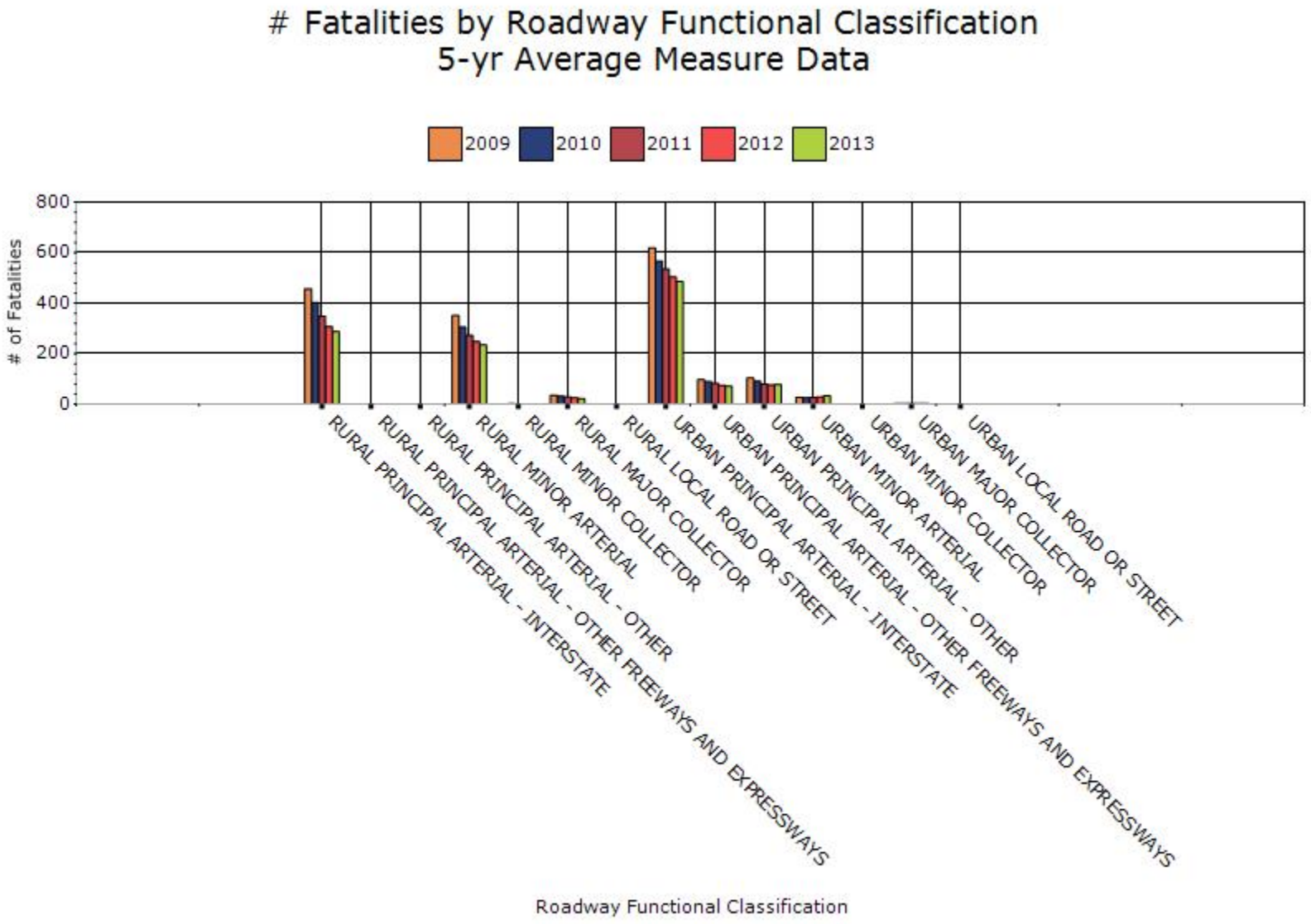
1. Broken or fractured bones.
2. Dislocated or distorted limbs.
3. Severe lacerations.
4. Skull, spinal, chest or abdominal injuries that go beyond “Other Visible Injuries.”
5. Unconsciousness at or when taken from the collision scene.
6. Severe burns

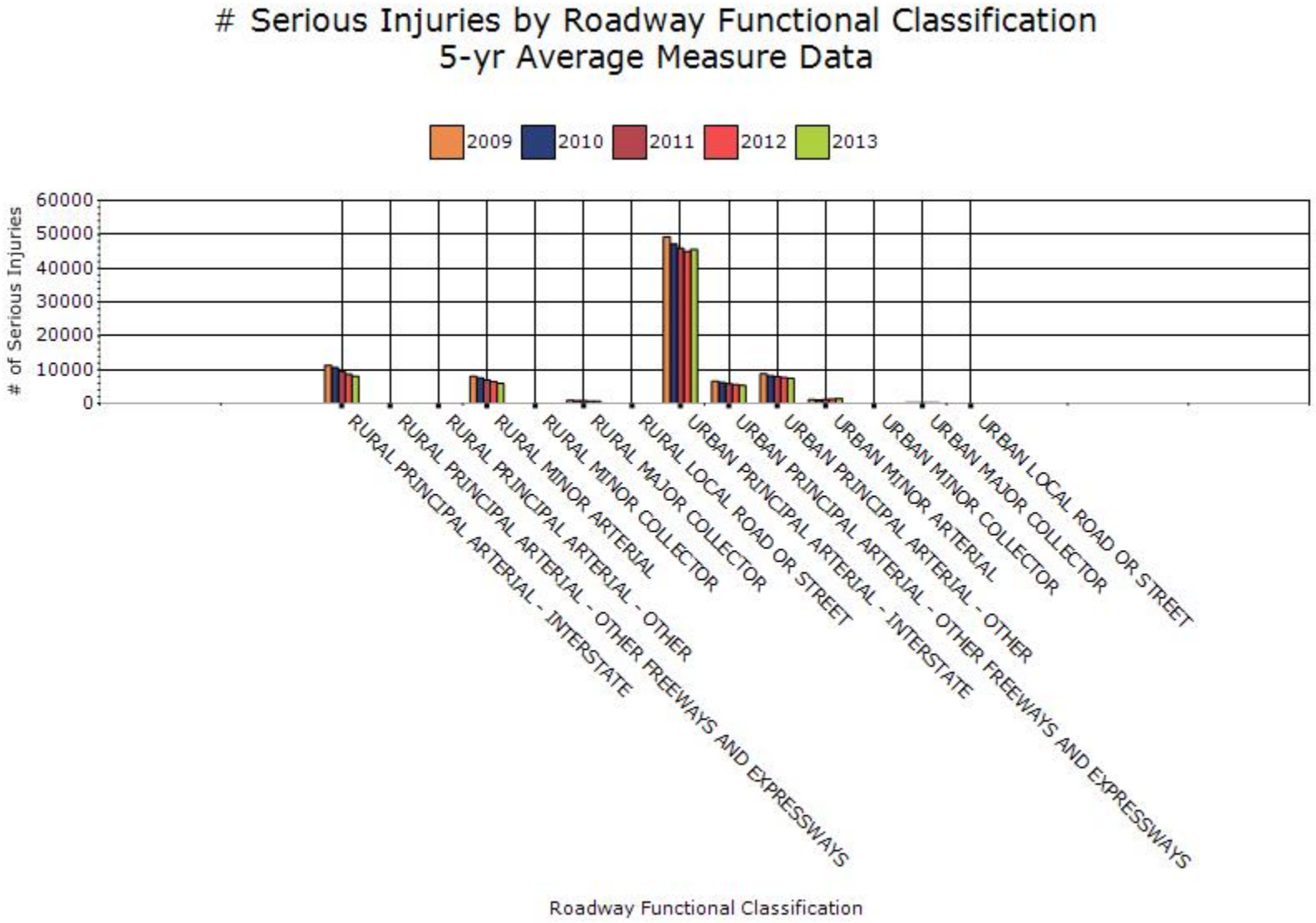
To the maximum extent possible, present performance measure* data by functional classification and ownership.

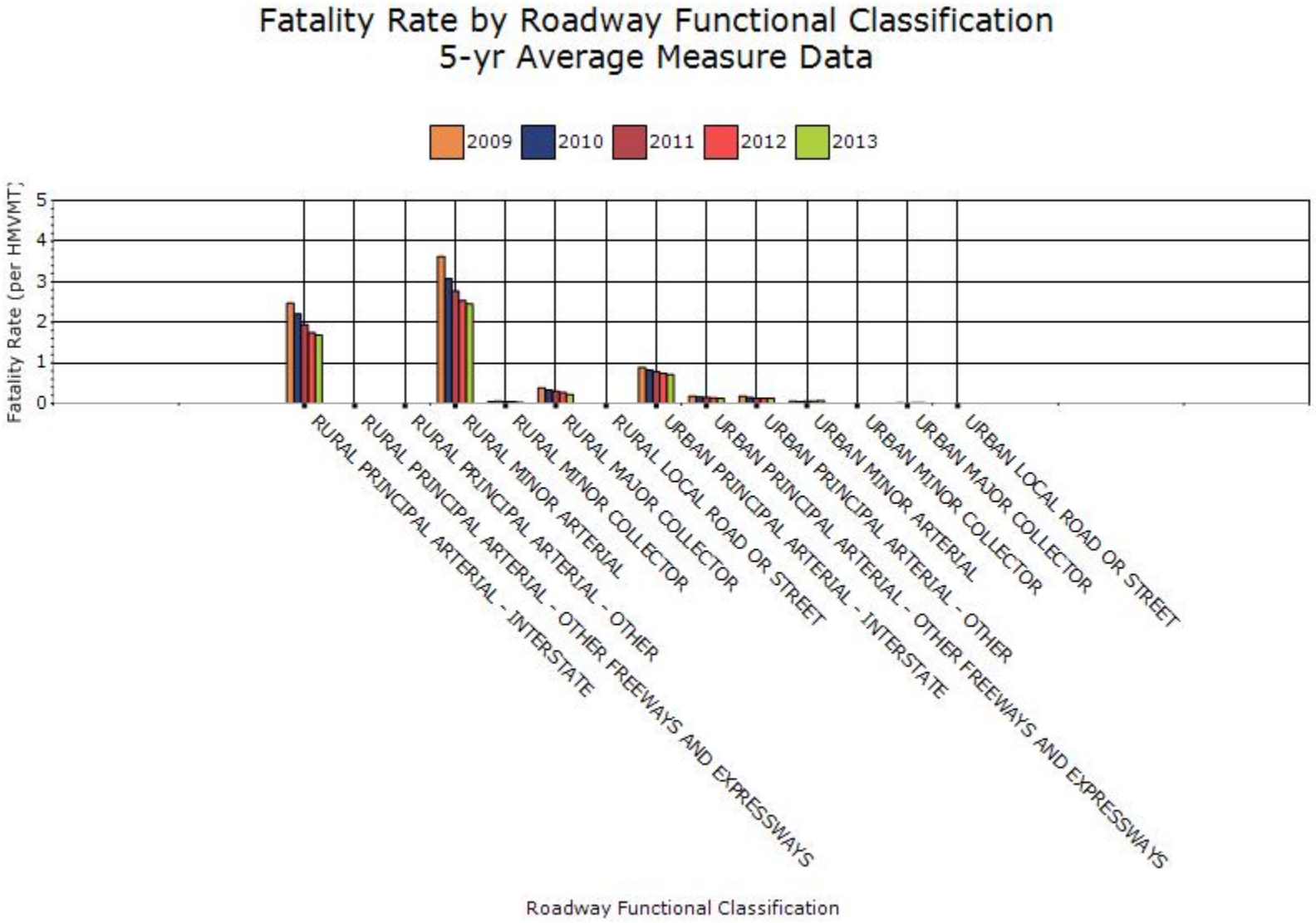
Year - 2013

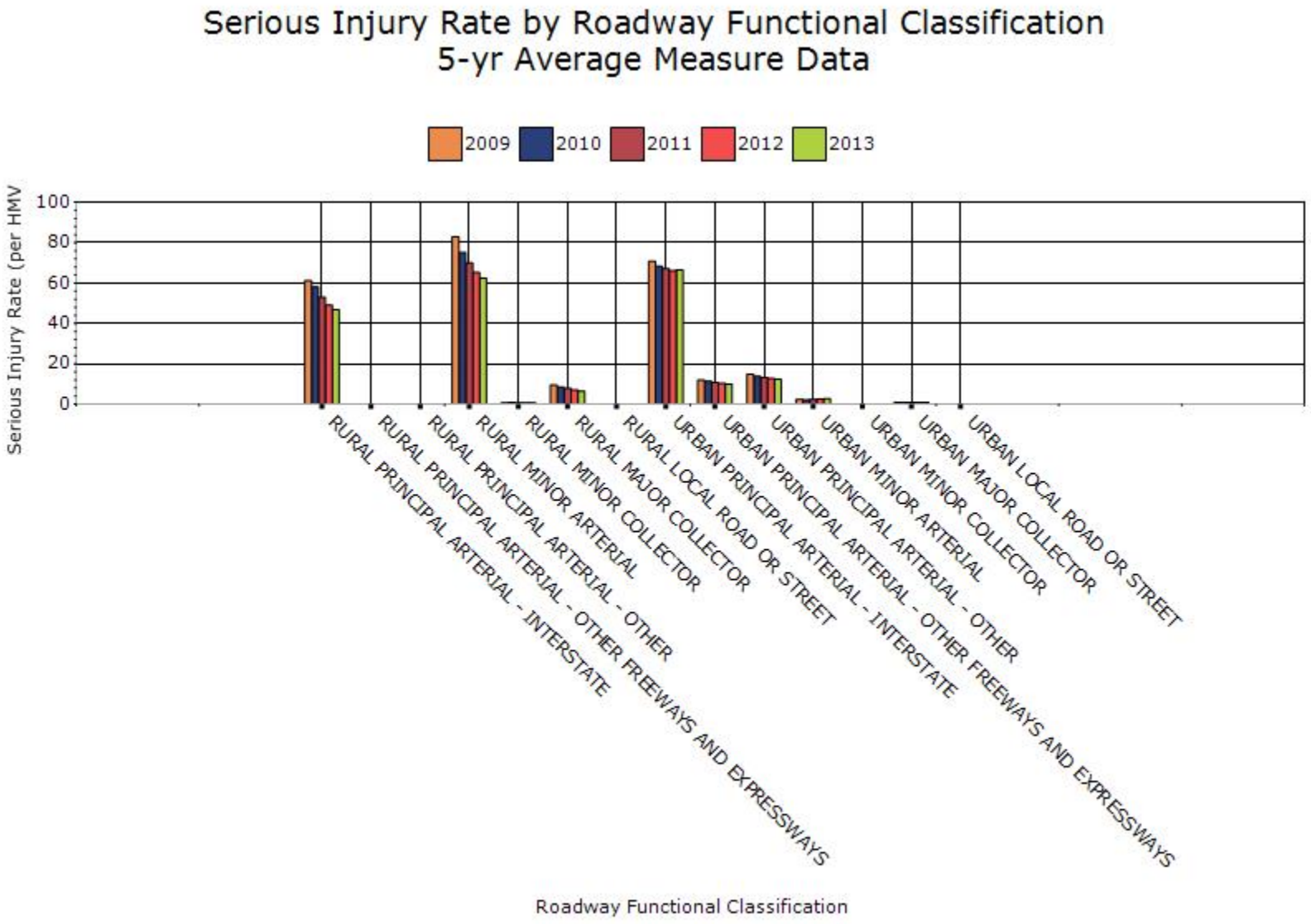
Function Classification	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
RURAL PRINCIPAL ARTERIAL - INTERSTATE	288	8044	1.69	46.91
RURAL MINOR ARTERIAL	235	6014	2.45	62.43
RURAL MINOR COLLECTOR		20	0.03	0.77
RURAL MAJOR COLLECTOR	22	637	0.22	6.51
URBAN PRINCIPAL ARTERIAL - INTERSTATE	485.4	45605	0.71	66.58
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS	71.6	5330.8	0.13	9.93
URBAN PRINCIPAL ARTERIAL - OTHER	78	7454.6	0.13	12.34
URBAN MINOR ARTERIAL	34	1384.8	0.07	2.81

URBAN MAJOR COLLECTOR	3.2	189	0.02	1.01
URBAN LOCAL ROAD OR STREET		2.6		0.01


Fatalities by Roadway Functional Classification
5-yr Average Measure Data
2009
2010
2011
2012
2013
800
600
400
200
0
# of Fatalities
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
Roadway Functional Classification

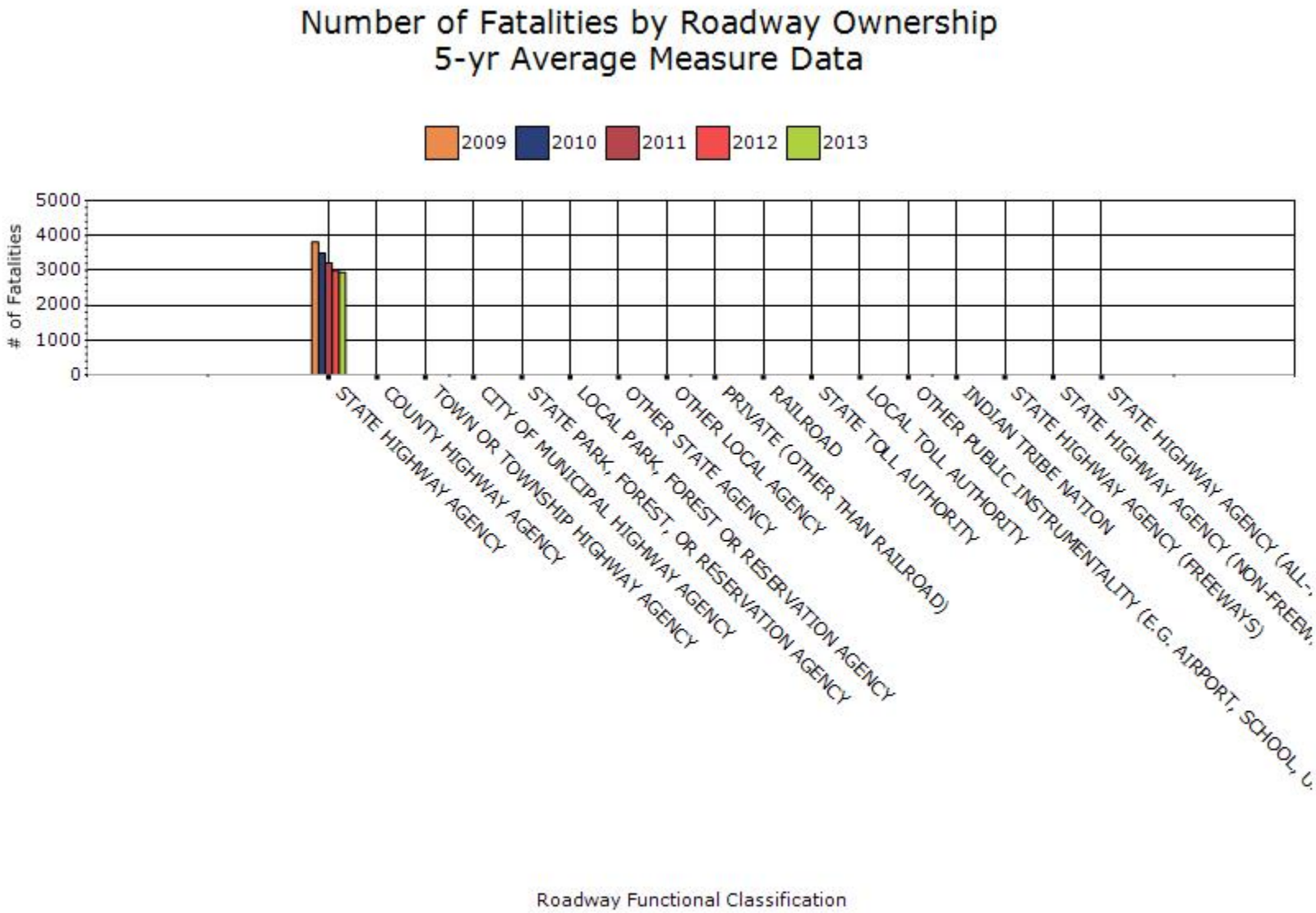

Serious Injuries by Roadway Functional Classification
5-yr Average Measure Data
2009
2010
2011
2012
2013
# of Serious Injuries
60000
50000
40000
30000
20000
10000
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
Roadway Functional Classification

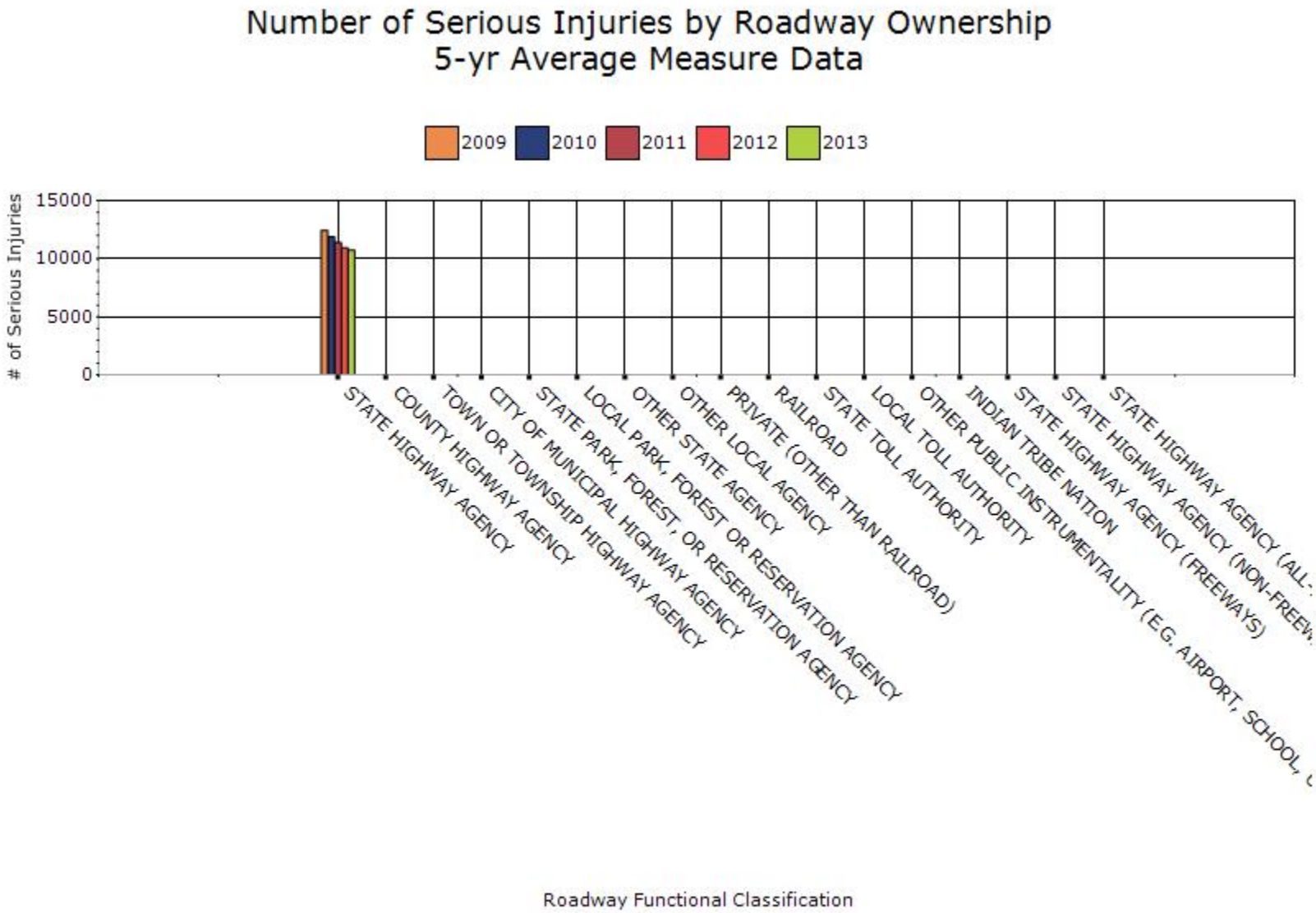

Fatality Rate by Roadway Functional Classification
5-yr Average Measure Data
2009
2010
2011
2012
2013
Fatality Rate (per HMVMT)
0
1
2
3
4
5
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
Roadway Functional Classification


Serious Injury Rate by Roadway Functional Classification
5-yr Average Measure Data
2009
2010
2011
2012
2013
Serious Injury Rate (per HMV
100
80
60
40
20
0
RURAL PRINCIPAL ARTERIAL - INTERSTATE
RURAL PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
RURAL PRINCIPAL ARTERIAL - OTHER
RURAL MINOR ARTERIAL
RURAL MINOR COLLECTOR
RURAL MAJOR COLLECTOR
RURAL LOCAL ROAD OR STREET
URBAN PRINCIPAL ARTERIAL - INTERSTATE
URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXPRESSWAYS
URBAN PRINCIPAL ARTERIAL - OTHER
URBAN MINOR ARTERIAL
URBAN MINOR COLLECTOR
URBAN MAJOR COLLECTOR
URBAN LOCAL ROAD OR STREET
Roadway Functional Classification

Year - 2013

Roadway Ownership	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)
STATE HIGHWAY AGENCY	2940	10748.07	0.91	3.29


Number of Fatalities by Roadway Ownership
5-yr Average Measure Data
2009
2010
2011
2012
2013
# of Fatalities
5000
4000
3000
2000
1000
0
STATE HIGHWAY AGENCY
COUNTY HIGHWAY AGENCY
TOWN OR TOWNSHIP HIGHWAY AGENCY
CITY OF MUNICIPAL HIGHWAY AGENCY
STATE PARK, FOREST, OR RESERVATION AGENCY
LOCAL PARK, FOREST OR RESERVATION AGENCY
OTHER STATE AGENCY
OTHER LOCAL AGENCY
PRIVATE (OTHER THAN RAILROAD)
RAILROAD
STATE TOLL AUTHORITY
LOCAL TOLL AUTHORITY
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL,
INDIAN TRIBE NATION
STATE HIGHWAY AGENCY (FREEWAYS)
STATE HIGHWAY AGENCY (NON-FREEW
STATE HIGHWAY AGENCY (ALL-
Roadway Functional Classification


Number of Serious Injuries by Roadway Ownership
5-yr Average Measure Data
2009
2010
2011
2012
2013
# of Serious Injuries
15000
10000
5000
0
STATE HIGHWAY AGENCY
COUNTY HIGHWAY AGENCY
TOWN OR TOWNSHIP HIGHWAY AGENCY
CITY OF MUNICIPAL HIGHWAY AGENCY
STATE PARK, FOREST, OR RESERVATION AGENCY
LOCAL PARK, FOREST OR RESERVATION AGENCY
OTHER STATE AGENCY
OTHER LOCAL AGENCY
PRIVATE (OTHER THAN RAILROAD)
RAILROAD
STATE TOLL AUTHORITY
LOCAL TOLL AUTHORITY
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL,
INDIAN TRIBE NATION
STATE HIGHWAY AGENCY (FREEWAYS)
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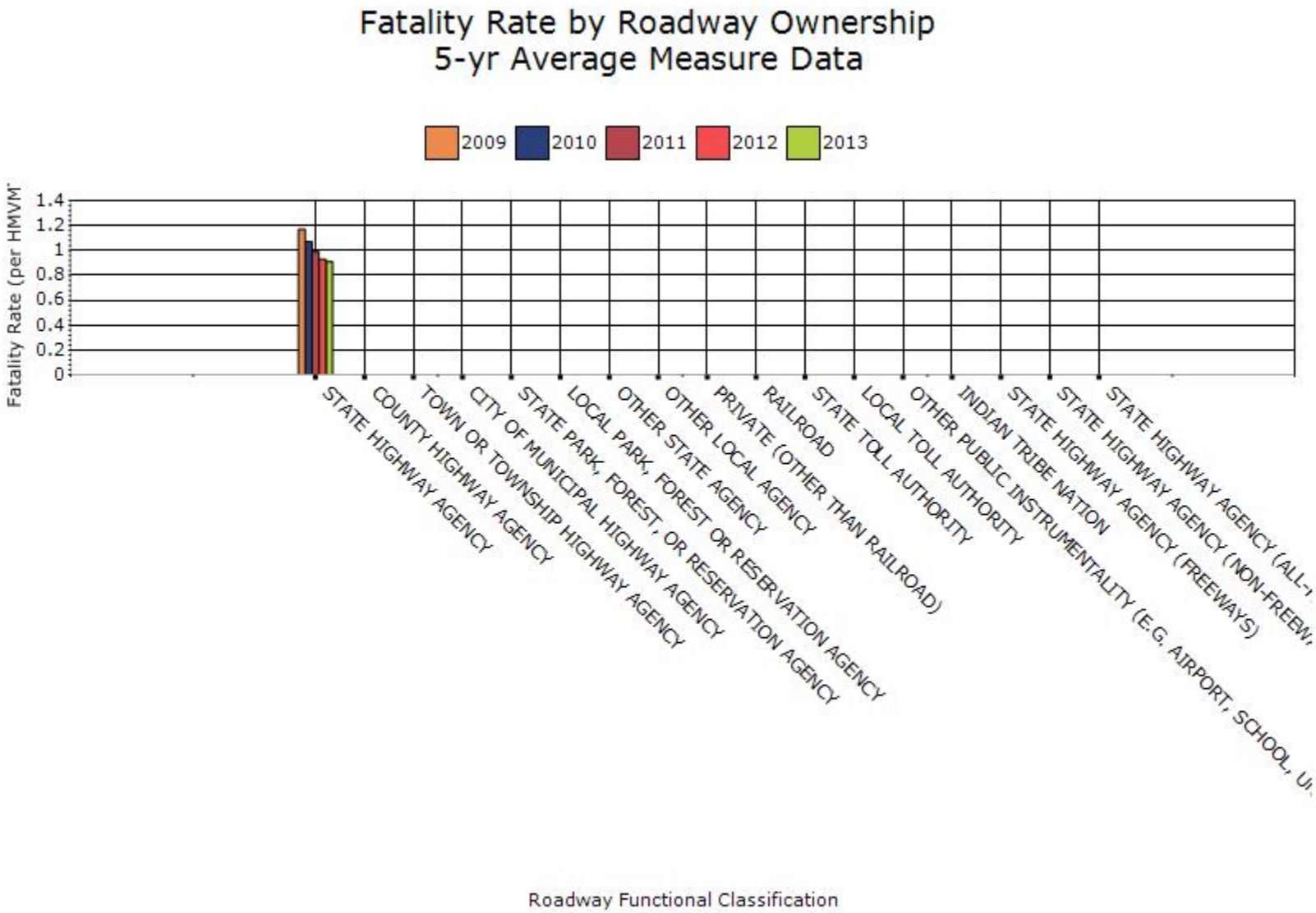
Roadway Functional Classification


Fatality Rate by Roadway Ownership
5-yr Average Measure Data
2009
2010
2011
2012
2013
Fatality Rate (per HMVM
1.4
1.2
1
0.8
0.6
0.4
0.2
0
STATE HIGHWAY AGENCY
COUNTY HIGHWAY AGENCY
TOWN OR TOWNSHIP HIGHWAY AGENCY
CITY OF MUNICIPAL HIGHWAY AGENCY
STATE PARK, FOREST, OR RESERVATION AGENCY
LOCAL PARK, FOREST OR RESERVATION AGENCY
OTHER STATE AGENCY
OTHER LOCAL AGENCY
PRIVATE (OTHER THAN RAILROAD)
RAILROAD
STATE TOLL AUTHORITY
LOCAL TOLL AUTHORITY
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, U
INDIAN TRIBE NATION
STATE HIGHWAY AGENCY (FREEWAYS)
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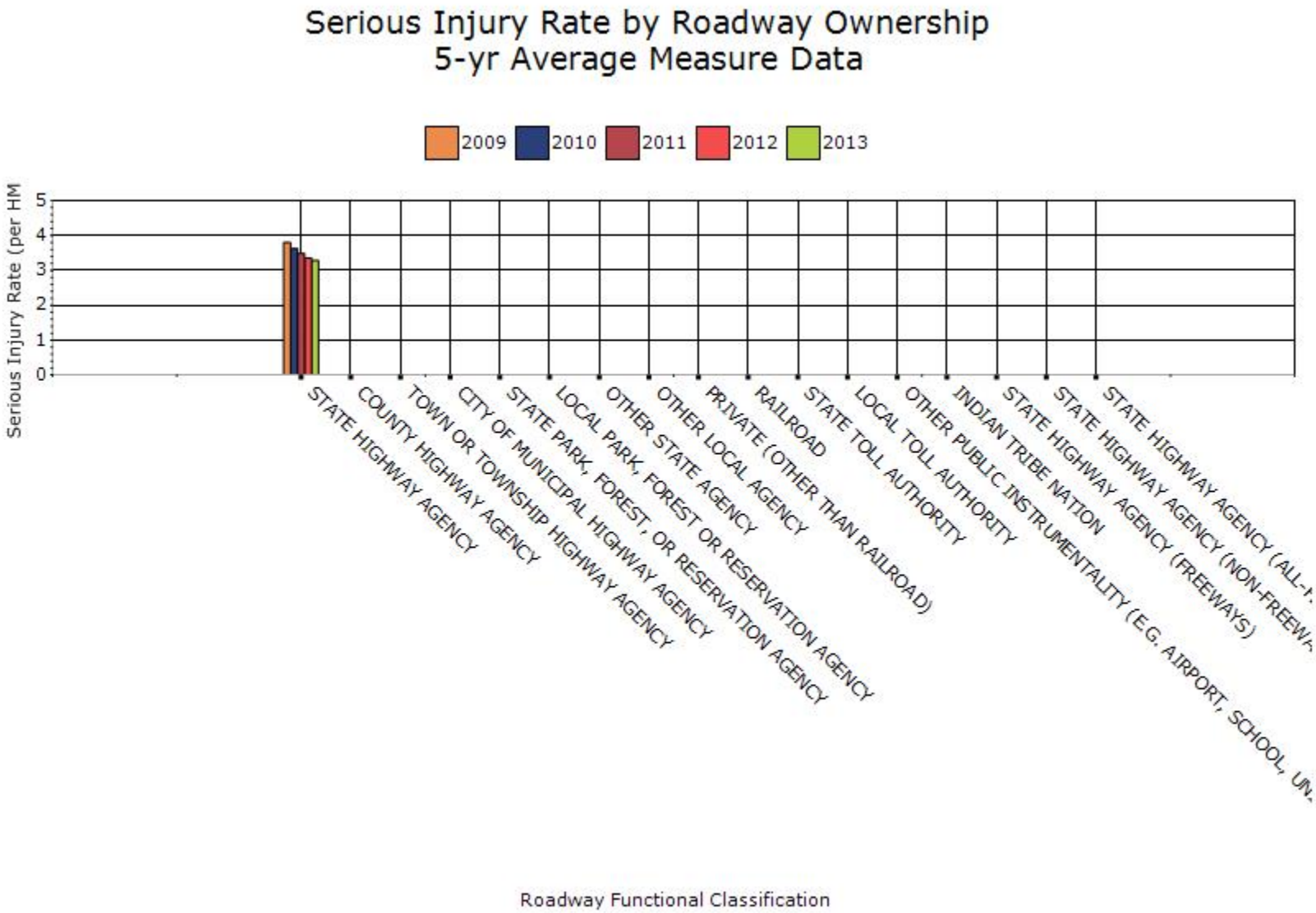
STATE HIGHWAY AGENCY (ALL-
Roadway Functional Classification


Serious Injury Rate by Roadway Ownership
5-yr Average Measure Data
2009
2010
2011
2012
2013
Serious Injury Rate (per HM
5
4
3
2
1
0
STATE HIGHWAY AGENCY
COUNTY HIGHWAY AGENCY
TOWN OR TOWNSHIP HIGHWAY AGENCY
CITY OF MUNICIPAL HIGHWAY AGENCY
STATE PARK, FOREST, OR RESERVATION AGENCY
LOCAL PARK, FOREST OR RESERVATION AGENCY
OTHER STATE AGENCY
OTHER LOCAL AGENCY
PRIVATE (OTHER THAN RAILROAD)
RAILROAD
STATE TOLL AUTHORITY
LOCAL TOLL AUTHORITY
OTHER PUBLIC INSTRUMENTALITY (E.G. AIRPORT, SCHOOL, UN
INDIAN TRIBE NATION
STATE HIGHWAY AGENCY (FREEWAYS)
STATE HIGHWAY AGENCY (NON-FREEWA
STATE HIGHWAY AGENCY (ALL-T
Roadway Functional Classification

7. The most recent data available to us was for 2013 calendar year.
8. The classification “Major Collector” in urban area in Caltrans data is specified as “Collector”.
9. Note that Caltrans currently does not compile collision data for *severe* injury as a separate category. The data for severe injury was not available for developing performance measure for the road classifications listed in this question. However, the data is available for 3 levels of injuries (i.e., severe injury, visible injury, and complaint of pain) combined. Therefore, the input data in ORT columns for *severe injury* and *severe injury rate* are in fact for *injury* and *injury rate*.
10. For this Fiscal Year reporting period, we developed the travel data for road classifications listed in ORT. The travel data are specific to each of the road classifications and are for state highways (travel data on specific local roads not available).
11. The data input for the“State Highway Agency” in Part-2 (Roadway Ownership) of this question are for state and local roads.
12. For this year reporting period, the 5 year rolling averages are determined based on number of victims in collisions fatally injured and severely injured as opposed to the performance measures based on fatal and severe injury collisions.

Describe any other aspects of the general highway safety trends on which you would like to elaborate.

For this year's reporting period, the most recent ten-year data available from Caltrans TSN database was for 2004 to 2013. During the 2013 calendar year, 1,076 fatal collisions, 41,791 injury collisions, and 69,777 property-damage-only (PDO) collisions were reported on the SHS. Caltrans estimates that these collisions resulted in societal economic losses of approximately $19.6 billion assuming collision costs for various injury severities derived by the National Safety Council.

The HSIP and other State programs have contributing to making highways safer through the implementation of highway safety projects. This fact is evident from the fatality rate trends. Between 2004 and 2013, the fatality rate on all State highways has decreased 34 percent. For the same period, the fatality rate on freeways decreased 34 percent, and on non-freeways it decreased 25 percent. During the same period, the annual travel decreased by 2.2 percent on all highways. The annual travel on freeways decreased 0.3 percent, and on non-freeways it decreased by 10.2 percent. Freeway travel in 2013 accounts for 83 percent of travel on the SHS even though freeway road miles account for only 29.1 percent of the SHS.

Implementing safety projects has contributed to reductions in fatality rates. Many other improvements such as tree trimming, restriping, or installing warning signs that were requested by Traffic Operations staff and performed by Maintenance staff in the districts also contributed to improved safety. During FY 2015/16, there were 70 Major and Minor-A traffic safety projects awarded at a cost of $242.5 million. All of these project types are consistent with one or more of the 16 challenge areas identified in California's Strategic Highway Safety Plan (SHSP). Furthermore, during FY 2015-16, Caltrans spent $225 millions beyond the federal obligated funds on traffic safety projects.

Application of Special Rules

Present the rate of traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65.

Older Driver Performance Measures	**2010**	**2011**	**2012**	**2013**	**2014**
Fatality rate (per capita)	4.05	3.8	3.54	3.51	3.48
Serious injury rate (per capita)	9.164	8.852	8.532	8.322	8.29

Fatality and serious injury rate (per capita)	13.216	12.65	12.074	11.828	11.772

*Performance measure data is presented using a five-year rolling average.

Calculate Rate of **Fatal (F) and Serious Injuries (SI) per capita for Drivers and Pedestrians 65 years of age and older** for year ending in 2014 (2014, 2013, 2012, 2011, 2010) and 2012 (2012, 2011, 2010, 2009, 2008). For purposes of this calculation, the term "Annual rate, year XXXX" (or "AR, year XXXX") means the following:

$$\frac{F + SI \text{ for drivers and pedestrians 65 years of age and older, year XXXX}}{\text{Pop. of drivers and pedestrians 65 years of age or older, year XXXX}}$$

1. Calculate Rate for 2014

Calculate the following to two decimal places, then round to the nearest tenth:

$$\frac{AR, 2014 + AR, 2013 + + AR, 2012 + AR, 2011 + AR, 2010}{5}$$

2. Calculate Rate for 2012:

Calculate the following to two decimal places, then round to the nearest tenth:

$$\frac{AR, 2012 + AR, 2011 + AR, 2010 + AR, 2009 + AR, 2008}{5}$$

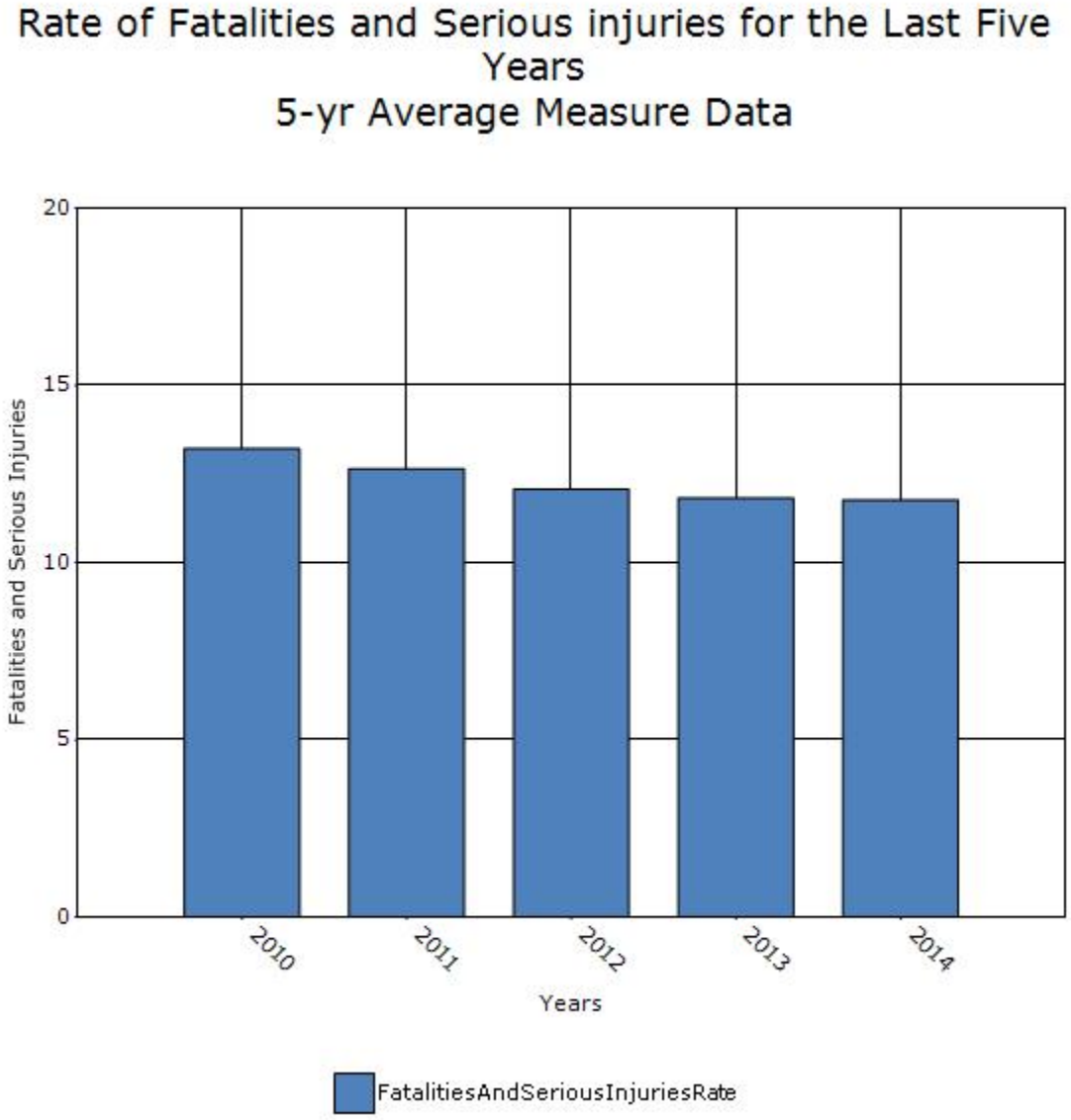
3. Compare Rate for 2014 to Rate for 2012

If the rate for 2014 (under step #1) exceeds the rate for 2012 (under step #2), then the Special Rule applies.

Rate for 2014 = 11.77

Rate for 2012 = 12.07

Reduction = (11.77-12.07)/11.77 = 2.6%



For this reporting year, we have revised the data to include fatalities and severe injuries by victims rather than collisions. Last year report was based on Fatal and injury collisions.

Does the older driver special rule apply to your state?

No

Assessment of the Effectiveness of the Improvements (Program Evaluation)

What indicators of success can you use to demonstrate effectiveness and success in the Highway Safety Improvement Program?

Benefit/cost

If 'benefit/cost', indicate the overall Highway Safety Improvement Program benefit/cost ratio.

11.9 to 1

What significant programmatic changes have occurred since the last reporting period?

None

Briefly describe significant program changes that have occurred since the last reporting period.

none

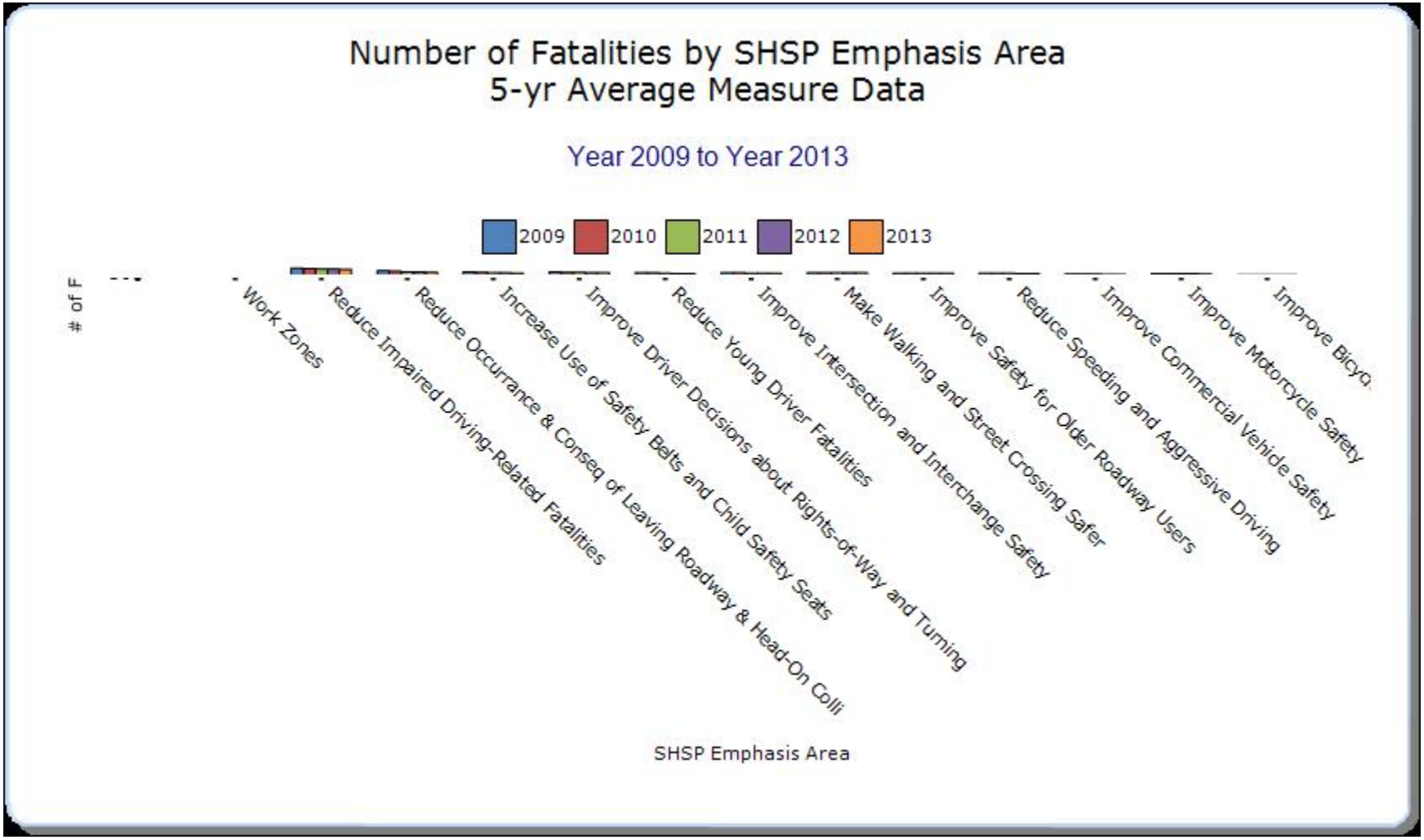
SHSP Emphasis Areas

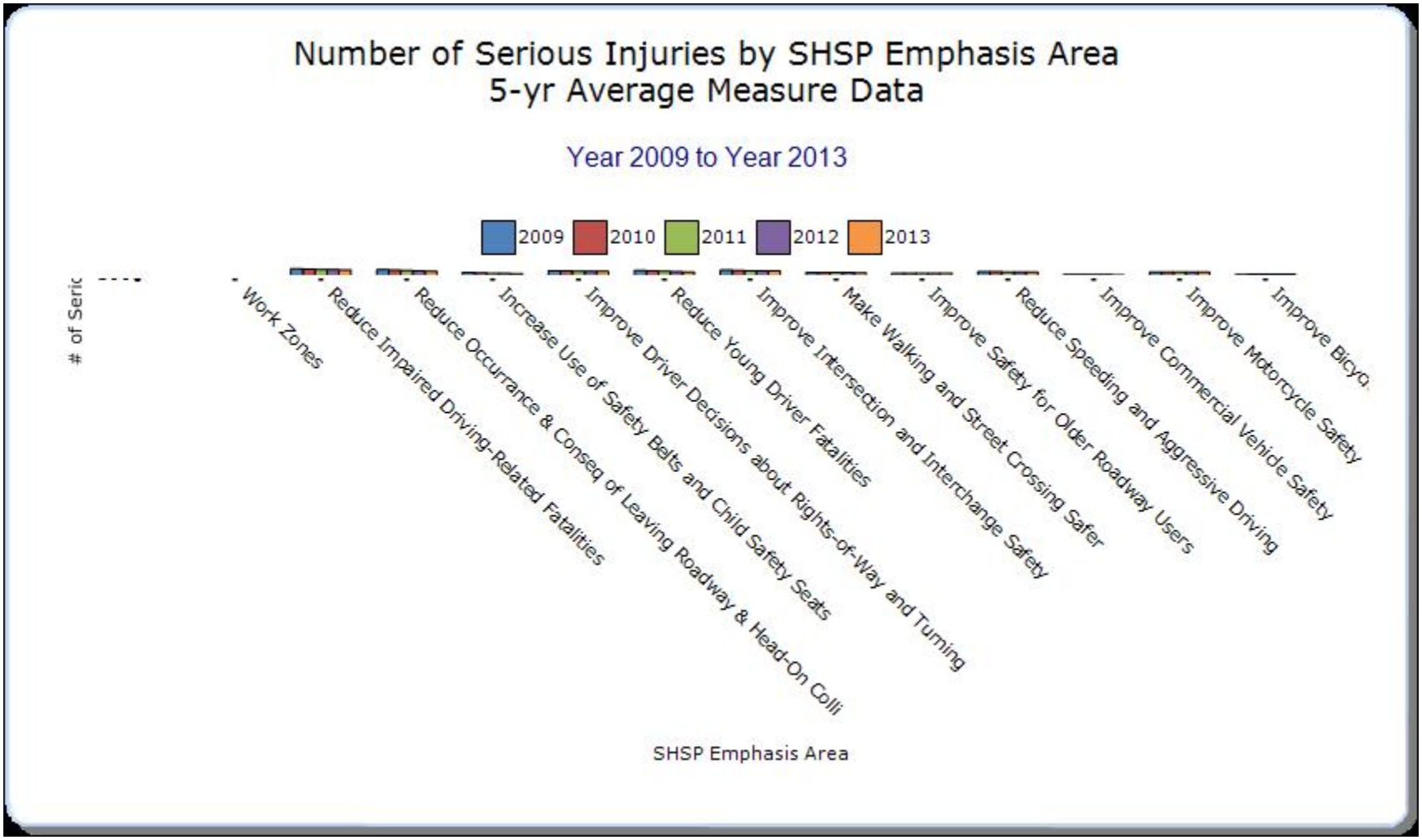
For each SHSP emphasis area that relates to the HSIP, present trends in emphasis area performance measures.

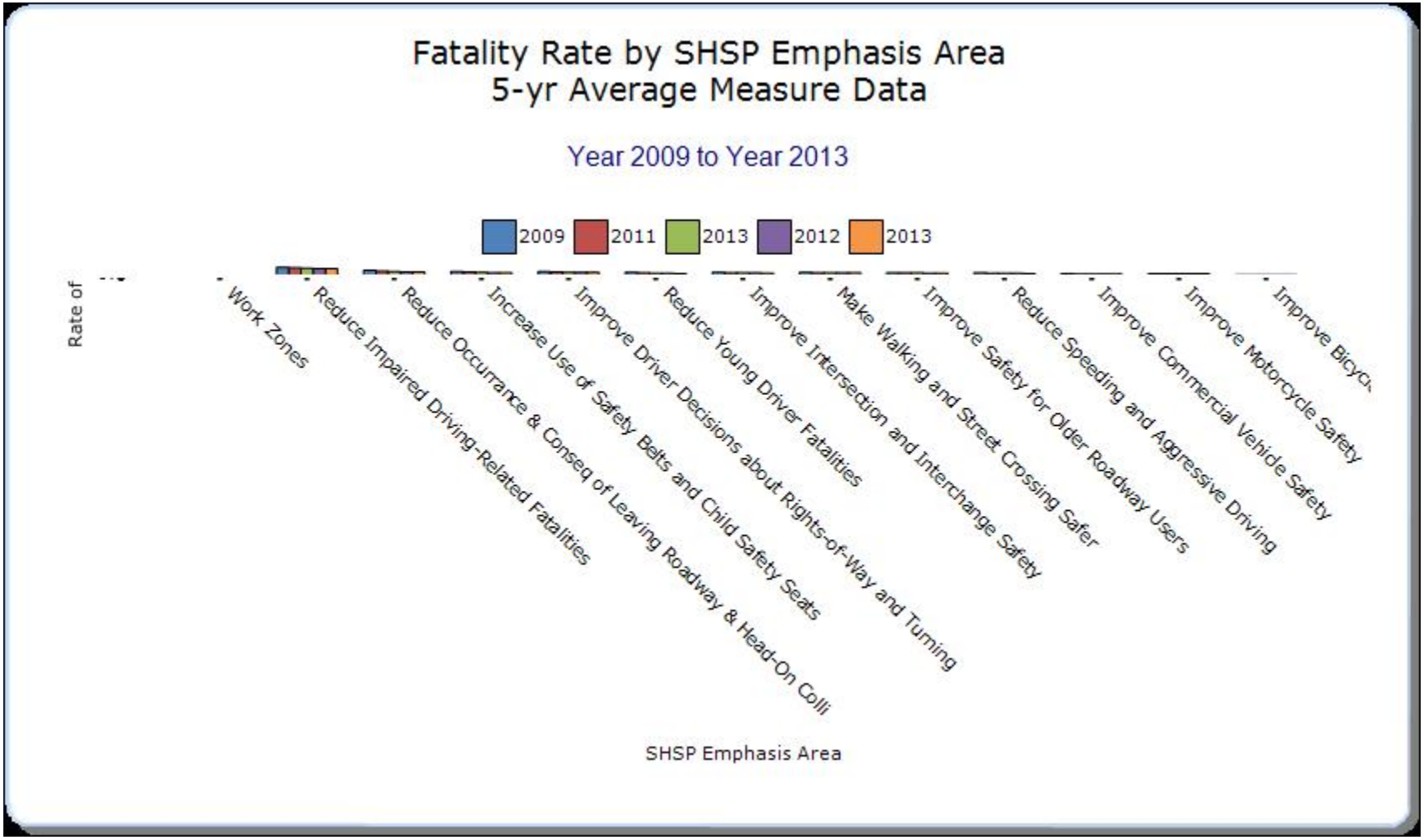
Year - 2013

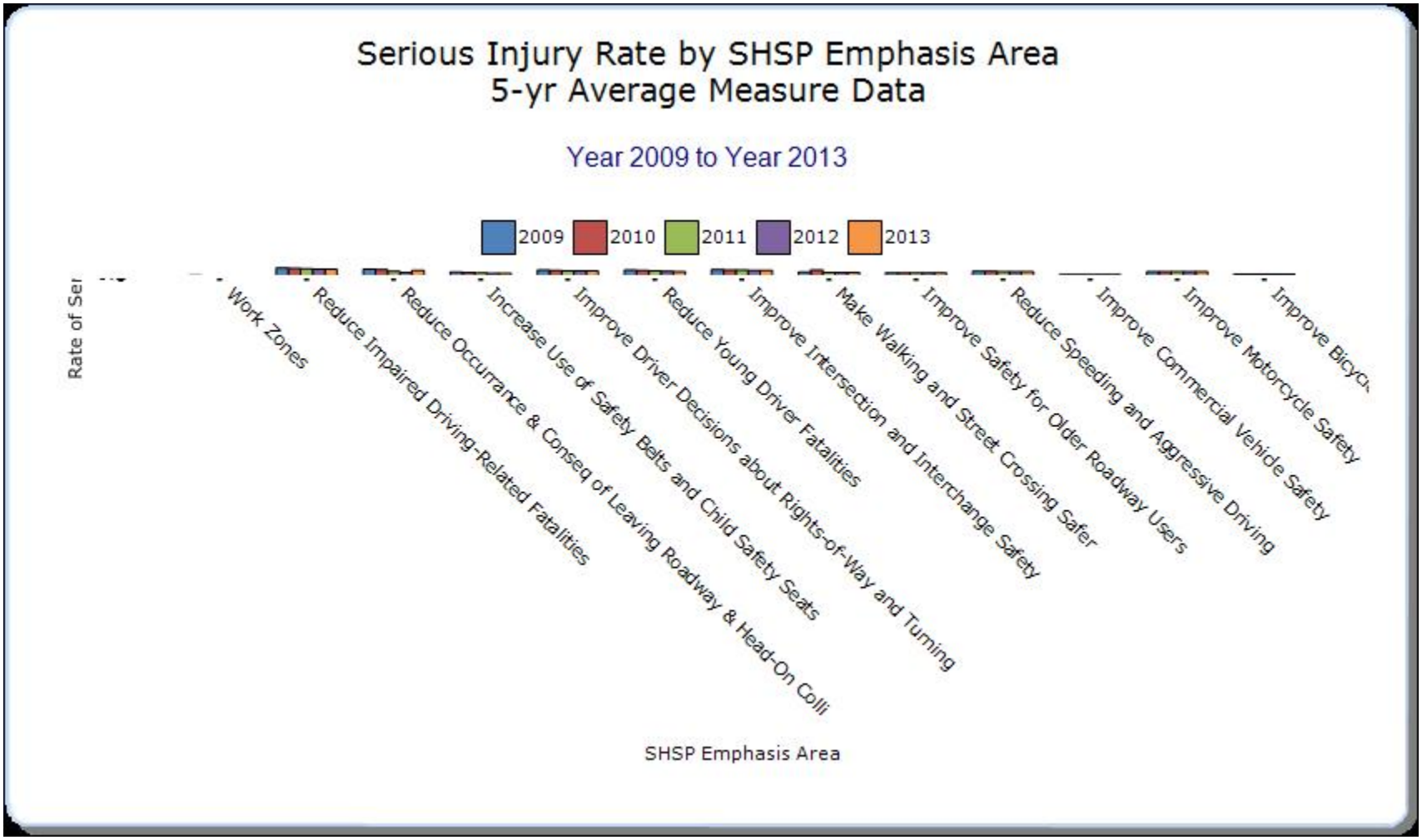
HSIP-related SHSP Emphasis Areas	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Work Zones		54.1	155.4	0.02	0.05			
Reduce Impaired Driving-Related Fatalities		1557.8	3074.23	0.48	0.94			
Reduce Occurrance & Conseq of Leaving Roadway & Head-On Colli		792.1	2474.2	0.24	0.76			
Increase Use of Safety Belts and Child Safety Seats		573	1146	0.18	0.35			
Improve Driver Decisions about Rights-of-Way and Turning		680.9	2311.2	0.21	0.71			
Reduce Young Driver Fatalities		429	1952.6	0.13	0.6			
Improve Intersection and Interchange Safety		568.2	2512	0.17	0.77			
Make Walking and Street Crossing Safer		663.8	1655.8	0.2	0.51			
Improve Safety for Older Roadway Users		567	1408.6	0.17	0.43			
Reduce Speeding and Aggressive Driving		457.2	1948.3	0.14	0.6			

Improve Commercial Vehicle Safety		293.8	603.2	0.09	0.19			
Improve Motorcycle Safety		409.6	1984.8	0.13	0.61			
Improve Bicycle Safety		130.6	939.6	0.04	0.29			




Number of Serious Injuries by SHSP Emphasis Area
5-yr Average Measure Data
Year 2009 to Year 2013
2009
2010
2011
2012
2013
# of Seric
Work Zones
Reduce Impaired Driving-Related Fatalities
Reduce Occurrance & Conseq of Leaving Roadway & Head-On Colli
Increase Use of Safety Belts and Child Safety Seats
Improve Driver Decisions about Rights-of-Way and Turning
Reduce Young Driver Fatalities
Improve Intersection and Interchange Safety
Make Walking and Street Crossing Safer
Improve Safety for Older Roadway Users
Reduce Speeding and Aggressive Driving
Improve Commercial Vehicle Safety
Improve Motorcycle Safety
Improve Bicyc
SHSP Emphasis Area


Fatality Rate by SHSP Emphasis Area
5-yr Average Measure Data
Year 2009 to Year 2013
2009
2011
2013
2012
2013
Rate of
Work Zones
Reduce Impaired Driving-Related Fatalities
Reduce Occurrance & Conseq of Leaving Roadway & Head-On Colli
Increase Use of Safety Belts and Child Safety Seats
Improve Driver Decisions about Rights-of-Way and Turning
Reduce Young Driver Fatalities
Improve Intersection and Interchange Safety
Make Walking and Street Crossing Safer
Improve Safety for Older Roadway Users
Reduce Speeding and Aggressive Driving
Improve Commercial Vehicle Safety
Improve Motorcycle Safety
Improve Bicycl
SHSP Emphasis Area



Groups of similar project types

Present the overall effectiveness of groups of similar types of projects.

Year - 2013

HSIP Sub-program Types	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Other-Wrong-Way Monitoring Report		26	214	0.02	0.14			
Other-2 & 3 Ln Cross Centerline Collision Monitoring Pro		151	3976	0.95	25.02			
Roadway Departure		180	3647	0.1	2.07			
Other-Local Roads Program		500	20000	2	60			
Median Barrier		24.8	172	0.02	0.11			

13. Local Road Program is specified as a subprogram due to ORT functionality limitations. We specified it as a subprogram so Caltrans Division of Local Assistance can report on their program. The performance measures values for only this subprogram are fictitious values so that ORT allows us to show the local roads as a subprogram. The progress for the local road program is reported in a separate attachment to question 23.
14. The data provided in the table of performance measures for the 5 subprograms are not plotted. This is due to ORT limitations where, only the performance measures that are defined by ORT are plotted.
15. Also, note that Caltrans currently does not compile collision data for *severe* injury as a separate category. However, the data is available for 3 levels of injuries (i.e., severe injury, visible injury, and complaint of pain) combined. Therefore, the

performance measures for the sub-programs had to be developed based on injury as a whole. The values shown for severe injury columns in this question represent the 3 levels of injuries combined.

Systemic Treatments

Present the overall effectiveness of systemic treatments.

Year - 2013

Systemic improvement	Target Crash Type	Number of fatalities	Number of serious injuries	Fatality rate (per HMVMT)	Serious injury rate (per HMVMT)	Other-1	Other-2	Other-3
Other-Median Barrier (see optional description)		25	172	0.02	0.11			

Caltrans currently does not compile collision data for *severe* injury as a separate category. However, the data is available for 3 levels of injuries (i.e., severe injury, visible injury, and complaint of pain) combined. Therefore, the performance measures were developed for injury as a whole. The values shown for severe injury columns in this question represent the 3 levels of injuries combined.

Describe any other aspects of the overall Highway Safety Improvement Program effectiveness on which you would like to elaborate.

The most recent annual collision data available was for 2013. Caltrans implements the HSIP for State highways by programming and funding projects in the Collision Reduction Category, one of eight categories that make up the State Highway Operation and Protection Program (SHOPP). The Collision Reduction Category is further divided into two programs: Safety Improvement, and Collision Severity Reduction. The Safety Improvement Program is among Caltrans' top priorities in the SHOPP and as a result, all projects that meet the criteria for the Safety Improvement Program are funded. These criteria include a benefit-cost analysis. The projects evaluated in this report include all projects funded by the Collision Reduction Category, which includes both federal HSIP and State highway funds.

Caltrans uses the Transportation System Network database to identify locations with significantly high collision concentrations. The identified locations are systematically investigated to determine probable causes of the collisions in order to implement effective countermeasures to improve safety. Other locations identified for investigation and possible implementation of countermeasures are generated from three Monitoring Programs: Cross Median Collisions, Two and Three Lane Cross Centerline Collisions, and Wrong Way Collisions.

Nearly 2,972 traffic safety investigations were completed between 01-01-2015 and 12-31-2015. In addition, 509 "Other Safety" investigations were completed. These other safety related investigations were not generated by TSN but by calls, letters, and emails from public. Finally, as of February, 2012, Caltrans has developed and in the process of implementing a 5-year "California Roadway Departure Safety Implementation Plan" which identified over 7,000 locations for potential low cost countermeasures to systematically implement on many state highways in an effort to reduce roadway departure crashes.

Implementing safety projects has contributed to the reduction in fatality rates. Many other improvements such as tree trimming, restriping, or installing warning signs that were requested by Traffic Operations staff and performed by Maintenance staff in the districts also contributed to improved safety. During FY 2015/16, there were 70 Major and Minor-A safety projects awarded at a cost of $242.5 million. All of these project types are consistent with one or more of the 16 challenge areas identified in California's Strategic Highway Safety Plan (SHSP).

The effectiveness of the State HSIP was measured by comparing collision data before and after safety improvements were implemented at project sites. These projects have been completed between 7/1/2011 and 6/30/2012. Three years of collision data before project implementation was compared with three years of collision data after project implementation. A total of 81 projects were considered in the evaluation. Analysis of collision data was based on 140 highway locations as some of the projects contained more than one highway location. The cost of implementing these projects was $144.9 million. The annual savings, in terms of reductions in collision frequency and severity, was estimated at $86.2 million. This translates to a savings of $1725 million or a benefit-cost ratio of 11.9 to1, assuming a project life of 20 years.

Project Evaluation

Provide project evaluation data for completed projects (optional).

Location	Functional Class	Improvement Category	Improvement Type	Bef-Fatal	Bef-Serious Injury	Bef-All Injuries	Bef-PDO	Bef-Total	Aft-Fatal	Aft-Serious Injury	Aft-All Injuries	Aft-PDO	Aft-Total	Evaluation Results (Benefit/ Cost Ratio)
Interstate 49, Section 28, Log Mile 41.44-45.74	Rural Principal Arterial - Interstate	Roadway	Pavement surface - high friction surface		2	16	42	60		1	12	15	28	3.77
Interstate 430, Section 21, Log mile 8.96-9.86	Urban Principal Arterial - Interstate	Roadway	Pavement surface - high friction surface	1	5	52	114	172		2	35	96	133	115.47

Interstate 40, Sections 43 and 51, Log mile 216.10 to 220.71	Rural Principal Arterial - Interstate	Roadway	Pavement surface - high friction surface			4	9	13			4	7	11	0.05

Optional Attachments

Sections	Files Attached
Progress in Implementing Projects: General Listing of Projects	A) Attach-Q23-State-HSIP-2016.xlsx
Progress in Implementing Projects: General Listing of Projects	B) Attach-Q23-Local HSIP-Sep2016.xlsx
Assessment of the Effectiveness of the Improvements (Program Evaluation): Groups of similar project types	4) Attach-Q33-HSIP 2016-ORT.xlsx
Assessment of the Effectiveness of the Improvements (Program Evaluation): Systemic Treatments	5) Attach-Q34-HSIP 2016-ORT.xlsx

Glossary

5 year rolling average means the average of five individual, consecutive annual points of data (e.g. annual fatality rate).
Emphasis area means a highway safety priority in a State's SHSP, identified through a data-driven, collaborative process.
Highway safety improvement project means strategies, activities and projects on a public road that are consistent with a State strategic highway safety plan and corrects or improves a hazardous road location or feature or addresses a highway safety problem.
HMVMT means hundred million vehicle miles traveled.
Non-infrastructure projects are projects that do not result in construction. Examples of non-infrastructure projects include road safety audits, transportation safety planning activities, improvements in the collection and analysis of data, education and outreach, and enforcement activities.
Older driver special rule applies if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a State increases during the most recent 2-year period for which data are available, as defined in the Older Driver and Pedestrian Special Rule Interim Guidance dated February 13, 2013.
Performance measure means indicators that enable decision-makers and other stakeholders to monitor changes in system condition and performance against established visions, goals, and objectives.
Programmed funds mean those funds that have been programmed in the Statewide Transportation Improvement Program (STIP) to be expended on highway safety improvement projects.
Roadway Functional Classification means the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide.
Strategic Highway Safety Plan (SHSP) means a comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.
Systematic refers to an approach where an agency deploys countermeasures at all locations across a system.
Systemic safety improvement means an improvement that is widely implemented based on high risk roadway features that are correlated with specific severe crash types.
Transfer means, in accordance with provisions of 23 U.S.C. 126, a State may transfer from an apportionment under section 104(b) not to exceed 50 percent of the amount apportioned for the fiscal year to any other apportionment of the State under that section.